REMARKS

This Amendment is fully responsive to the non-final Office Action dated November 23, 2010, issued in connection with the above-identified application. A request for a two-month extension of time is included. Claims 27-30 are pending in the present application. With this Amendment, claims 27 and 29 are amended. No new matter has been introduced by the amendments made to the claims. Favorable reconsideration is respectfully requested.

In the Office Action, claims 27 and 29 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Sohm et al. (U.S. Patent No. 7,260,148, hereafter "Sohm") in view of "Information Technology-Coding of audio-visual-objects Part 2" (Visual ISO/IED 14496-2 Second Edition, December 2001, hereafter "ISO-14496"), Tucker et al. (U.S. Patent No. 5,903,313, hereafter "Tucker"), Fredericksen et al. (U.S. Patent No. 5,272,529, hereafter "Fredericksen"), and further in view of well known prior art (Official Notice) and Wang et al. (U.S. Publication No. 2005/0152454, hereafter "Wang").

The Applicants have amended independent claims 27 and 29 to more clearly distinguish the present invention from the cited prior art. Independent claim 27 (as amended) recites:

"[a] motion compensation method for generating a predictive image of a current macroblock included in a current picture with reference to a motion vector of an adjacent macroblock that is located adjacent to the current macroblock, the motion compensation method comprising:

specifying, using an adjacent macroblock specifying unit, plural adjacent macroblocks which are located adjacent to the current macroblock and are already decoded;

deriving, using a motion vector deriving unit, a motion vector of a current macroblock;

generating, using a generating unit, a predictive image of the current macroblock using the derived motion vector of the current macroblock; and

performing, using a motion compensation unit, motion compensation on the current macroblock using the generated predictive image of the current macroblock, and

wherein, in the case where the motion compensation on the current macroblock is prohibited to a size smaller than 8 pixels by 8 pixels,

dividing, using a dividing unit, the current macroblock into a plurality of current blocks, each having a size of 8 pixels by 8 pixels;

specifying, using a co-located macroblock specifying unit, a co-located marcoblock

which is co-located with the current macroblock and is included in a picture different from a current picture including the co-located macroblock;

specifying, using a co-located block specifying unit, a co-located block which is co-located with each of the current blocks and is included in the co-located macroblock;

setting, using a motion vector setting unit, a motion vector of the co-located block to be one motion vector when the co-located block is composed of one block for which motion compensation has been performed and the co-located block is motion compensated using only the one motion vector, and setting a motion vector of the co-located block to be a motion vector of a corner block which is included in the co-located block and is located in a corner of the co-located macroblock when the co-located block is composed of a plurality of blocks for which motion compensation has been performed and a size of each of the plurality of blocks is different from a size of the current block;

judging, using a motion vector size judging unit, if a size of the one motion vector or the motion vector of the corner block is within a predetermined range;

deriving, using the motion vector deriving unit, a motion vector of respective current blocks in the current macroblock (i) by using plural motion vectors of specified plural adjacent macroblocks when the size of the one motion vector or the motion vector of the corner block is beyond the predetermined range, or (ii) by setting a motion vector of the respective current blocks to be "0" when the size of the one motion vector or the motion vector of the corner block is within the predetermined range;

generating, using a generating unit, a predictive image of the respective current blocks included in the current macroblock, using the derived motion vector of the respective current blocks; and

performing, using the motion compensation unit, a motion compensation on the respective current blocks using the generated predictive image of the respective current blocks." (Emphasis added).

The features emphasized above in independent claim 27 are similarly recited independent claim 29 (as amended). That is, independent claim 29 is directed to a corresponding apparatus that includes all the features of the method of independent claim 27. The features emphasized above in independent claim 27 (and similarly recited independent claim 29) are also fully supported by the Applicants' disclosure.

In the Office Action, the Examiner relies on the combination of Sohm, ISO-14496, Tucker, Frederiksen, well known prior art (i.e., Official Notice) and Wang for disclosing or suggesting all the features recited in independent claims 27 and 29. However, the Applicants assert that no combination of Sohm, ISO-14496, Tucker, Frederiksen, the Official Notice taken by the Examiner and Wang discloses or suggests all the features now recited in independent claims 27 and 29, as amended.

Independent claim 27 now recites:

"setting, using a motion vector setting unit, a motion vector of the co-located block to be one motion vector when the co-located block is composed of one block for which motion compensation has been performed and the co-located block is motion compensated using only the one motion vector, and setting a motion vector of the co-located block to be a motion vector of a corner block which is included in the co-located block and is located in a corner of the co-located macroblock when the co-located block is composed of a plurality of blocks for which motion compensation has been performed and a size of each of the plurality of blocks is different from a size of the current block." The features noted above with reference to independent claim 27 are similarly recited in independent claim 29.

Sohm discloses searching neighbor blocks when estimating motion of a current block (see e.g., col. 17, lines 11-19). As described in Sohm, pixels in each neighbor block are compared to pixels in a current block and the best correlated motion vector is assigned as a predicted motion vector (see e.g., col. 17, lines 20 to 28 and Fig. 9).

ISO-14496 discloses motion compensation derived by scaling motion vectors of a co-located macroblock to determine a motion vector of a current macroblock (see e.g., section 7.6.9.5.1). Further, ISO-14496 discloses determining an average of motion vectors of all the pixels included in a co-located macroblock and using the average for motion compensation in a temporal direct mode (see e.g., section 7.6.9.5.2).

Tucker discloses determining whether or not to perform motion compensation by comparing a threshold value with a size of a motion vector (see e.g., col.4, lines 27 to 39, col. 7, lines 29 to 51; and Fig. 4A, element 48).

Frederiksen discloses that a DCT processor generates an 8 x 8 coefficient array, wherein three baseband coefficients included in the coefficient array are passed to a data flow manager (see e.g., col. 7, lines 33 to 40). Additionally, mid-band and high-band vectors formed by other

coefficients in the coefficient array are passed to a vector quantizer (see e.g., col.7, lines 40 to 44). As described in Frederiksen, the vectors entering the vector quantizer are compared to a threshold value, and when the resultant difference is less than the threshold value, a zero vector value is inserted for that vector (see e.g., col. 7, lines 45 to 51).

Wang discloses that a macroblock can be further divided into smaller sized blocks. For example, as shown in Figs. 3a-f, a macroblock can be further divided into block sizes of 16 x 8 pixels, 8 x 16 pixels, 8 x 8 pixels, 8 x 4 pixels, 4 x 8 pixels, or 4 x 4 pixels.

Based on the above discussion of the cited prior art, even if Sohm, ISO-144496, Tucker, Frederiksen and Wang are combined, the combination fails to disclose or suggest at least the following features now recited in independent claims 27 (and similarly recited in independent claim 29):

"setting, using a motion vector setting unit, a motion vector of the co-located block to be one motion vector when the co-located block is composed of one block for which motion compensation has been performed and the co-located block is motion compensated using only the one motion vector, and setting a motion vector of the co-located block to be a motion vector of a corner block which is included in the co-located block and is located in a corner of the co-located macroblock when the co-located block is composed of a plurality of blocks for which motion compensation has been performed and a size of each of the plurality of blocks is different from a size of the current block."

Additionally, independent claim 27 now recites:

"deriving, using the motion vector deriving unit, a motion vector of respective current blocks in the current macroblock (i) by using plural motion vectors of specified plural adjacent macroblocks when the size of the one motion vector or the motion vector of the corner block is beyond the predetermined range, or (ii) by setting a motion vector of the respective current blocks to be "0" when the size of the one motion vector or the motion vector of the corner block is within the predetermined range." The features noted above with reference to independent claim 27 are similarly recited in independent claim 29.

The most relevant cited prior art with respect to the above features of independent claim 27 (and similarly recited in independent claim 29) are noted below.

Sohm discloses that pixels in each neighbor block are compared to pixels in a current block and the best correlated motion vector is assigned as a predicted motion vector (see e.g., col. 17, lines 20 to 28 and Fig. 9).

Additionally, ISO-14496 discloses motion compensation by scaling motion vectors of a co-located macroblock to determine a motion vector of a current macroblock (see e.g., section 7.6.9.5.1). Further, ISO-14496 discloses determining an average of motion vectors of all the pixels included in a co-located macroblock (see e.g., section 7.6.9.5.2).

Nothing in Sohm or ISO-14496 discloses or suggests the following features now recited in independent claims 27 (and similarly recited in independent claim 29):

"deriving, using the motion vector deriving unit, a motion vector of respective current blocks in the current macroblock (i) by using plural motion vectors of specified plural adjacent macroblocks when the size of the one motion vector or the motion vector of the corner block is beyond the predetermined range, or (ii) by setting a motion vector of the respective current blocks to be "0" when the size of the one motion vector or the motion vector of the corner block is within the predetermined range."

Additionally, independent claim 27 now recites:

"generating, using a generating unit, a predictive image of the respective current blocks included in the current macroblock, using the derived motion vector of the respective current blocks; and

performing, using the motion compensation unit, a motion compensation on the respective current blocks using the generated predictive image of the respective current blocks."
The features noted above with reference to independent claim 27 are similarly recited in independent claim 29.

As noted above, the cited prior art (e.g., Sohm and ISO-14496) fails to disclose or suggest the features of "*deriving, using the motion vector deriving unit, a motion vector of respective current blocks in the current macroblock"* now recited in independent claims 27 and 29.

Accordingly, it logically follows that the cited prior art also fails to disclose or suggest generating a predictive image of the respective current blocks included in the current macroblock, <u>using the derived motion vector of the respective current blocks</u>; and performing a

motion compensation on the respective current blocks <u>using the generated predictive image of the respective current blocks</u>.

Based on the above discussion, no combination of Sohm, ISO-14496, Tucker, Frederiksen, the Official Notice taken by the Examiner and Wang would result in, or otherwise render obvious, the features now recited in independent claims 27 and 29 (as amended).

In the Office Action, claims 28 and 30 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Sohm in view of ISO-14496, Tucker, Frederiksen, the Official Notice taken by the Examiner and Wang, and further in view of Chang et al. (U.S. Patent No. 6,483,876).

Claims 28 and 30 depend respectively from independent claims 27 and 29. As noted above, Sohm, ISO-14496, Tucker, Frederiksen, the Official Notice by the Examiner and Wang fail to disclose or suggest all the features now recited in independent claims 27 and 29 (as amended). Additionally, Chang fails to overcome the deficiencies noted above in Sohm, ISO-14496, Tucker, Frederiksen, the Official Notice taken by the Examiner and Wang. Accordingly, no combination of Sohm, , ISO-14496, Tucker, Frederiksen, the Official Notice taken by the Examiner and Wang in combination with Chang would result in, or otherwise render obvious, the features of claims 28 and 30 at least by virtue of their respective dependencies from independent claims 27 and 29.

In light of the above, the Applicants submit that all the claims pending in the present application are patentable over the prior art of record. Accordingly, the Applicants respectfully request that the Examiner withdraw the rejections in the Office Action, and pass the present application to issue.

The Examiner is invited to contact the undersigned attorney by telephone to resolve any issues remaining in the present application.

Respectfully submitted,

Shinya KADONO et al.

/Mark D. Pratt/
By 2011.04.19 11:45:04 -04'00'

Mark D. Pratt
Registration No. 45,794
Attorney for Applicants

MDP/mac
Washington, D.C. 20005-1503
Telephone (202) 721-8200
Facsimile (202) 721-8250
April 19, 2011